



## **PEST MANAGEMENT BACKGROUND**

### **Introduction**

A pest is an insect, animal, or plant that presents a risk to human health, destroys property, creates an unsightly condition, or hinders the success of an educational program(s). Pest management is the control of pests to avoid these negative impacts on the school building, students, teachers, and other building occupants.

### ***Insects***

Insects considered pests include termites, flies, bees, wasps, and cockroaches. Termites can damage the wood structure of a building, furniture or other wood products. Flies carry bacteria and other microbes and can contaminate food, eating utensils, or surfaces. Cockroaches can transmit disease-causing organisms, can contaminate foods and utensils, and cause allergic reactions in sensitive individuals.

### ***Rodents***

The most common animal pests in schools include rats, and mice. Rodents can damage food, documents, and other materials through gnawing, urination, defecation, and nesting activities. Some rodents have been found to transmit hantavirus and other diseases to humans through their fleas, urine, feces, and possibly through bites. Rodents can cause fires by chewing through the insulation on electrical wires, and they can spread human pathogens. The allergens from rodents and cockroaches can trigger strong respiratory reactions in individuals with allergies and asthma.

### ***Plants***

Many plants can be considered pests. Unwanted plants can be invasive to natural environments such as wetlands or meadows that were conserved or established as educational study areas. Invasive plants can compromise the diversity of the natural environment lessening its value as a habitat number and location of pests. Nonchemical

and as an educational resource. Unwanted plants can establish themselves in gardens or landscaped areas. Some plants may present a hazard to people because of their thorns, sharpness of their leaves, or allergic reaction by some people.

### ***Pesticides***

Pesticides have long been considered a primary method for the control of pests in schools. Pesticides have been used, on a regularly scheduled basis, as a preventive method to avoid pest management problems. While this approach may have been acceptable in the past it is no longer accepted practice. Pesticides are toxic (poisonous) chemicals that are designed to kill pests. As such, they present potential hazards to other living organisms at sufficiently high levels. There is little knowledge on the health effects of low-level, long period exposures to nonagricultural pesticides in environments such as schools and homes. In 1993, the National Research Council, a committee of the National Academy of Sciences reported that the risk of harm from exposure to pesticides is higher for infants and children than for adults. Exposure to applied pesticides can cause severe short-term and/or long-term reactions in sensitive individuals and some asthmatics. For these reasons, Integrated Pest Management -- an approach to pest control that eliminates or dramatically reduces the exposure of children to pesticides, has become accepted practice.

### **Integrated Pest Management**

IPM is a system of controlling pests that does not rely on the automatic use of pesticides. Instead, pests are monitored by regularly scheduled inspections of school buildings and grounds. Decisions on necessary actions are made based on pre-established thresholds for the

pest management techniques are given

priority. When the use of a pesticide is required, it is selected and applied in such a manner to minimize the exposure to people. Finally, IPM is characterized by good communication with all stakeholders, careful recordkeeping and the evaluation of actions that are taken.

Monitoring for pests involves setting action thresholds, conducting visual inspections, the use of monitoring traps, estimating the size of pest populations, and identifying factors contributing to the pest problem. Action thresholds depend on the pest and the site. For example, a few ants in a basement storage room might not require any action while ants in the food preparation area of a school would demand a response. Each building including the grounds receives an initial inspection. Based on the findings, the frequency of inspections of individual buildings will vary. While the entire building is inspected, special attention is given to areas that are more prone to providing a habitat, food, and water to insects or animals such as:

- ② cafeterias,
- ② kitchens,
- ② faculty lounges,
- ② locker rooms,
- ② family/consumer science laboratories,
- ② recycling collection points,
- ② loading docks.

Visual inspections not only focus on observing pests but also the evidence of pests such as droppings, tracks, damage, and shed insect skins. As the result of an inspection, traps are often placed as a future monitoring tool.

The most common nonchemical pest management methods include sanitation/housekeeping, pestproofing, and trapping. Vacuuming is an important part of a sanitation program because vacuuming removes food and other debris that serve as food for insects and animals. Vacuum cleaners are also useful to collect the pests or their remains or droppings when fitted with efficient filters that can remove small allergenic particles. Power washing, using a high-pressure stream of water, is sanitation technique used to clean food or tray carts, trash rooms, trash cans, dumpsters, loading

docks, or bird roosting areas.

Pestproofing physically changes a building to make it less attractive to pests or to keep pests from entering in the first place. Pestproofing can include weather stripping doors, repairing screens on windows, sealing cracks and crevices on exterior walls, caulking or sealing around pipes or conduits where pest enter the building, repairing roof leaks, and repairing leaky plumbing fixtures or pipes in lavatories. Pestproofing on school grounds can include removing or replacing plants or mulch that maintain moisture and provide habitat for insects or animals, regrading areas in proximity to the building foundation to eliminate standing rain water, or placing a concrete pad under a dumpster to increase the ease of cleaning and decrease access from pests.

Trapping for insects, mice, and rats is an easy and nontoxic method of control. The three major types of traps for insects are sticky traps, which use an adhesive to capture insects; pheromone traps, which use chemical attractants to draw pests into the trap; and blacklight traps, which use ultraviolet light to lure certain flying insects. Traps for mice and rats include glue boards, snap traps, and multi-catch traps. Multi-catch traps are capable of catching up to 20 animals without having to be reset.

Pesticides may be used in an IPM program when nonchemical techniques have not been successful and/or the pest poses an immediate hazard to building occupants. Two documents, the pesticide label and the material safety data sheet (MSDS) are the primary sources of information on the toxicity, and the safe use of a pesticide. Toxicity, the capacity to cause illness or injury, falls into three categories printed on the label: danger (highly poisonous); warning (moderately toxic); and caution (slightly or relatively nontoxic). However, one must consider that some pesticides are diluted before use while others are used at full strength. The rule of thumb is to use the pesticide whose end-use product is least toxic to people. Other factors to consider are volatility (how fast a pesticide

vaporizes when exposed to the air), and formulation (wetttable powder, dust, emulsifiable concentrate, pressurized aerosol, bait, or other form).

### ***Record-keeping***

It is important to have a careful system of records for monitoring activities, pest control actions, and assessment of success or failure. Careful recordkeeping will help to continually improve the program. It is also important to have good communication between the people implementing IPM and those affected by the program. Good communication will gain support for the program and avoid misunderstandings. Notification of staff, parents, and guardians prior to a pesticide application is a critical communication component of IPM and can be handled in a variety of ways. Notification can be accomplished by advanced posting around the school and by sending notices home with students. A voluntary registry may be kept of individuals who have medically documented adverse effects by exposure to pesticides and want to be directly contacted.

### ***Training***

IPM can be performed by school employees, pest control contractors, or both in combination. However, IPM can be successful only if implemented by properly trained and/or certified personnel. The education of central office and school level staff, parents, guardians, students, and others is also important. For example, housekeeping, food service, and teaching staff play an important role in identifying or avoiding pest problems. Housekeeping and maintenance staff will often identify pestproofing needs or implement work orders. Parents, guardians, and students need understand the principles and notification policies of the IPM program.

### **Other Resources**

For an excellent and comprehensive review of IPM in schools, refer to the U.S. EPA document, *IPM for Schools: A How-to Manual*, (EPA 909-B-97-001, March 1997). It is available in .pdf format from the EPA's website at

[www.epa.gov/region09/toxic/pest/school/index.html](http://www.epa.gov/region09/toxic/pest/school/index.html).

Another website, developed by the University of Florida, Institute of Food and Agricultural Sciences, has extensive information on setting up an IPM program, IPM training, and other technical information is found at <http://gmv2.ifas.ufl.edu/~schoolipm/>.

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This document has been developed for the H.E.L.P. for Kids Project. Contributing to this backgrounder: Allen Abend, Architect, Baltimore, MD; Bradley Turk, Mountain West Technical Associates.